

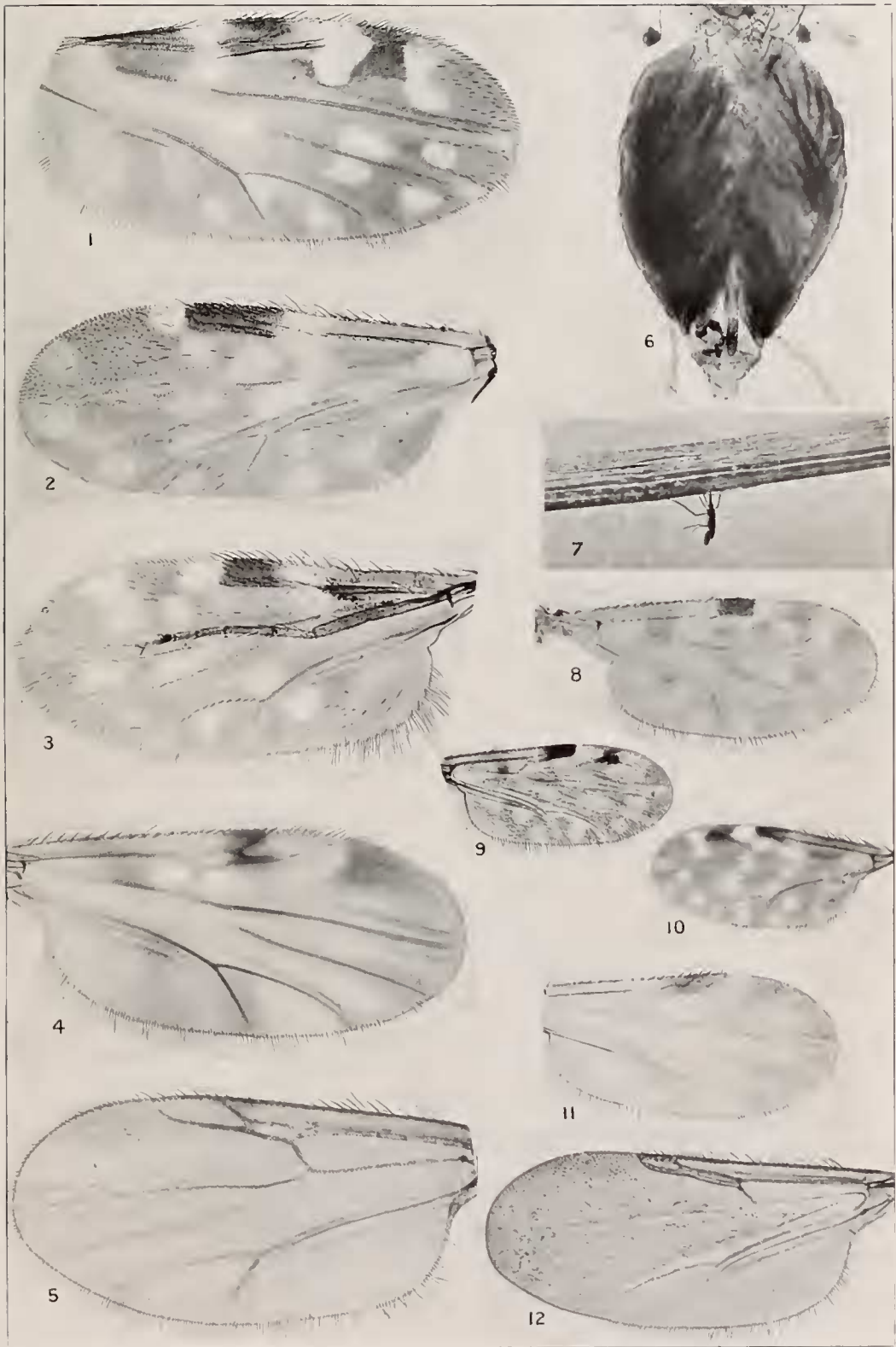
*L. velox*, a rare species whose habits have not been observed. It would seem that in this subfamily only the three genera, *Leptoconops* (sens. lat.), *Culicoides* and *Lasiohelea*, are regularly addicted to sucking the blood of mammals. Recorded cases of blood-sucking by members of any of the other genera are very few, and some even of these can be eliminated. Thus Meigen's statement, repeated by Verrall, that *Forcipomyia bipunctata* bites severely, is certainly due either to an error of identification, or to a more or less accidental occurrence; the species is abundant in this country and has never been observed to bite within recent years. Austen's *Johannseniella fulvithorax*, taken in the act of biting, is really a *Culicoides*, as recently shown by Carter. De Meijere's *Ceratopogon salmi* and *C. vexans*, described as blood-sucking species, appear from the descriptions to belong either to *Forcipomyia* or *Dasyhelea*. Prof. de Meijere informs me that there is no actual evidence that they suck blood, the collector merely supposing them to be capable of doing so on account of the structure of their mouth-parts; the specimens described by de Meijere were mostly captured at light. Malloch's record of the biting of *Dasyhelea grisea* stands alone so far as this genus is concerned, and confirmation is desirable; I have seen no evidence that any of the British species of *Dasyhelea*, one of which is closely allied to *D. grisea*, ever attempt to suck blood. Kieffer has recently published a paper entitled "Nouveaux Chironomides piqueurs habitant le Sleswig-Holstein" (Ann. Soc. Sci. Bruxelles, Feb. 1922) in which various species of *Forcipomyia* and *Atrichopogon*, as well as *Culicoides* are described, but he adduces no evidence to show that any of the species are actually blood-suckers.

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EXPLANATION OF PLATE III.

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- Fig. 1. *Culicoides peregrinus*, Kieffer, wing,  $\times 64$ .  
" 2. " *guttifer*, de Meijere, wing,  $\times 64$ .  
" 3. " *oxystoma*, Kieffer, wing,  $\times 64$ .  
" 4. " *anophelis*, sp. n., wing,  $\times 64$ ; maximum intensity of markings (balsam mount).  
" 5. " *anophelis*, sp. n.; minimum intensity of markings (dry mount).  
" 6. " *anophelis*, sp. n., abdomen distended with eggs,  $\times 46$ ; the three spermathecae are visible to the left of the tip of the egg that is ready for deposition.  
" 7. *Anopheles fuliginosus*, attacked by *C. anophelis*; photographed from nature by Dr. W. A. Lamborn.  
" 8. *Culicoides maculithorax*, Williston, wing,  $\times 46$ ; shown for comparison with *C. oxystoma* and *C. loughnani*; specimen from Jamaica.  
" 9. " *loughnani*, sp. n., wing,  $\times 32$ .  
" 10. " *loughnani*, var. *jamaicensis*, nov., wing,  $\times 32$ .  
" 11. " *pungens*, de Meijere, wing of type,  $\times 64$ ; balsam mount, for comparison with *C. anophelis*.  
" 12. " *arenarius*, sp. n., wing,  $\times 43$ ; dry mount.
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SPECIES OF *CULICOIDES*.



## ON THE AUSTRALIAN FERN WEEVILS.

By GUY A. K. MARSHALL, C.M.G., D.Sc.

(Plates VI-VIII.)

The weevil, *Syagrius fulvitaris*, Pasc., has been known for some time as an enemy of ferns, Mr. W. W. Froggatt having found it abundantly attacking ferns both in greenhouses and in the open in the Botanic Gardens at Sydney.

In 1902 another species, *S. intrudens*, Waterh., was found to be doing serious damage to greenhouse ferns in the Royal Botanic Gardens, Dublin, and Prof. G. H. Carpenter recorded that in 1912 it had actually established itself and was breeding in the open (Econ. Proc. R. Dublin Soc., ii, no. 6, Aug. 1913). There can be little doubt that this species must have been introduced from Australia, but its original home has not yet been ascertained, and Dublin remains as the only locality from which it has been recorded.

In 1904 yet another species belonging to a different genus, *Neosyagrius cordipennis*, was described by Mr. A. M. Lea, the insect having been found by Mr. W. W. Froggatt damaging maidenhair ferns in the Botanic Gardens at Sydney.

Since about 1905 *Syagrius fulvitaris* has been known to occur in the Hawaiian Islands in the vicinity of Honolulu, but it does not appear to have attracted any special attention until the last few years, when it has begun to spread to a somewhat disquieting extent and has started to attack the fern forests, the destruction of which might seriously affect the water supply. As the attempts to control it have not been altogether satisfactory, the Hawaiian Sugar Planters' Experiment Station arranged to send Mr. C. E. Pemberton to New South Wales in order to discover and bring back parasites of the weevil, a task which he has successfully accomplished.

Mr. Pemberton also brought back a number of the weevils found attacking wild ferns, and these have been kindly submitted to me by Mr. F. Muir for identification. The material, upon examination, proved to comprise no less than seven different species, namely, *Syagrius fulvitaris* and four undescribed species of the genus, and two new species of *Neosyagrius*; neither *S. intrudens* nor *N. cordipennis* was represented. One of the new species of *Syagrius*, represented by a single specimen, is not dealt with here because examples of it have already been submitted by Mr. Pemberton to Mr. A. M. Lea, who proposes to describe it.

The types of the new species will be deposited in the British Museum, and in those cases in which there is more than one specimen there are cotypes in the collection of the Hawaiian Sugar Planters' Experiment Station.

*Key to the Species of Syagrius, Pasc.*

- 1 (4). Interval 3 of elytra with a rounded granular tubercle at a little distance from the base.
- 2 (3). Funicle with joint 2 much longer than 1; dorsal outline of pronotum almost straight (apart from the median tubercles), but sloping markedly upwards in front; tubercles on elytra high and well marked, the intervals on the inflexed margins without granules . . . . . *fulvitaris*, Pasc.
- 3 (2). Funicle with the two basal joints subequal; dorsal outline of pronotum markedly convex; tubercles on elytra low and mostly ill-defined, the lateral intervals with flattened shiny granules . . . . . *intrudens*, Waterh.
- 4 (1). Interval 3 of elytra with a large elongate granular tubercle that extends right up to the base.



- 5 (8). Rostrum not constricted at the base; femora rugosely granulate; tarsi clothed above with very fine hairs.
- 6 (7). Funicle with the two basal joints subequal; elytra not constricted at the base, the lateral intervals entirely without granules. . . . . *costicollis*, sp. n.
- 7 (6). Funicle with joint 2 distinctly longer than 1; elytra constricted at the base, the lateral intervals with flattened shiny granules . . . . . *pembertonii*, sp. n.
- 8 (5). Rostrum shallowly constricted laterally at the base; femora not granulate, almost smooth; tarsi clothed above with long stout flattened fulvous setae . . . . . *squamipes*, sp. n.

**Syagrius costicollis**, sp. nov. (Plate vi, fig. 3).

♂♀.—Integument dull black, without scaling, but with sparse fulvous setae. *Head* very minutely aciculate on the vertex and with very shallow, sparse punctures; the forehead very coarsely punctate, with two low median elevations separated by a rather deep depression. *Rostrum* with the whole surface minutely aciculate, and therefore opaque in the ♂, but the dorsal area more shiny in the ♀; coarsely and closely punctate, except on the apical area, on which the punctures are small, shallow and separated (♂), or more or less longitudinally confluent (♀); the dorsal area rather indistinctly tricarinate, the outer carinae uniting into a point at the base, and the dorsal outline strongly and regularly curved; a deep, straight, shallowly punctate furrow on each side above the scrobe. *Antennae* red-brown; the two basal joints of the funicle subequal, the remainder slightly transverse, joint 7 more distinctly so; the basal joint of the club shorter than the rest of the club. *Prothorax* a little broader than long, strongly rounded at the sides, widest well before the middle, the anterior dorsal margin gently arcuate; a broad, smooth, flat median costa that reaches neither base nor apex, the remainder of the surface coarsely and confluent punctate, and the ridges between the punctures subtuberculate, there being two median tubercles higher than the rest, one on each side of the costa; the apices of most of the tubercles shiny, the rest of the surface opaque; a few sparse, short, recumbent setae, these being denser along the basal margin. *Elytra* suboblong, the sides not narrowed or constricted at the base; the rows of punctures shallow and rather irregular on the disk, much deeper and quite regular laterally; interval 1 bearing a few, irregularly spaced, minute granules along the suture; interval 2 narrow and very indefinite, with still fewer and variable granules; interval 3 with a large elongate basal tubercle set with shiny granules, a few granules at the middle, a slightly raised cluster of granules just behind these, a large rounded granular tubercle at the top of the declivity rather densely clothed with fulvous setae, and an elongate granular tubercle on the declivity; interval 4 almost without granules; interval 5 with irregular clusters of granules throughout, the one at the top of the declivity tuberculate and elongate; interval 6 almost smooth; interval 7 with a row of indistinct granules and a small tubercle at its apex; the lateral intervals devoid of granules. *Legs* rugosely granulate; the femora with an indefinite ring of pale setae at one-third from the apex; the tarsi red-brown.

*Length*, 3.4–5 mm.; *breadth*, 1.25–1.85 mm.

NEW SOUTH WALES: Nimbin, near head waters of Richmond River, iv.1921 (*Pemberton*).

Described from 28 specimens.

Readily distinguished from both the previously described species of *Syagrius* by the form of the basal tubercle on interval 3 of the elytra, which is elongate and extends right up to the base so that its upper surface continues the level of the dorsal outline (*cf.* Plate vi, fig. 4, *a*); whereas in the other two species this tubercle is rounded and placed at an appreciable distance from the base (Plate vi, fig. 6, *a*). It is further distinguished from all the species here dealt with by the fact that the elytra are not narrowed or constricted at the base.